

2005 PASS Community Summit

Microsoft SQL Server Users Conference & Expo

504M

Upgrading the Database Engine

New Features in the SQL Server 2005 Database Engine

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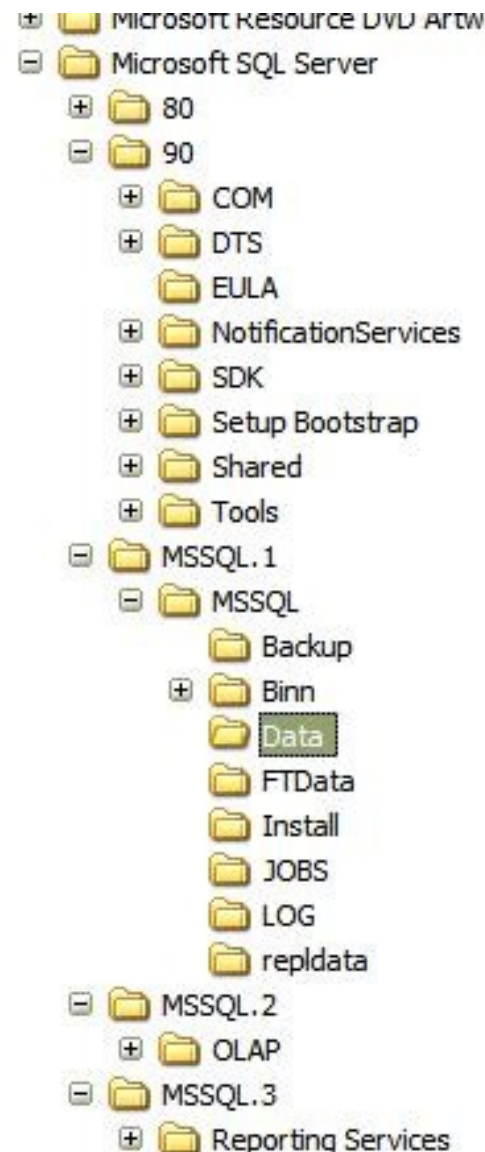
What We Will Cover

- Upgrading the Database Engine
 - Instances and Directory Structures
 - Resource Database
 - System Tables / Metadata
 - Backwards Compatibility
- New Features in the Database Engine
- Transparent Benefits of Upgrading to SQL Server 2005



Instances and Directory Structures

- Each 'instance' is assigned an 'instance id'
 - One each for
 - SQL Server, Agent, FTSearch
 - Analysis Services
 - Reporting Services
- Registry has similar structure
 - And description of structure



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USERS WORKING TOGETHER

Data

File Edit View Favorites Tools Help

Address **C:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\Data** Go Links >>

msn Search Desktop Form Fill Blocked (2) Spaces My MSN >>

Folders	Name	Size	Type	Date Modified
Microsoft Resource DVD Artwor	AdventureWorks_Data.mdf	166,016 KB	SQL Server Databa...	9/26/2005 4:51 PM
Microsoft SQL Server	AdventureWorks_Log.ldf	2,048 KB	SQL Server Databa...	9/26/2005 4:51 PM
80	AdventureWorksDW_Data.mdf	68,672 KB	SQL Server Databa...	9/26/2005 4:51 PM
90	AdventureWorksDW_Log.ldf	2,048 KB	SQL Server Databa...	9/26/2005 4:51 PM
COM	distmdl.ldf	2,816 KB	SQL Server Databa...	8/30/2005 5:48 AM
DTS	distmdl.mdf	5,120 KB	SQL Server Databa...	8/30/2005 5:48 AM
EULA	master.mdf	4,096 KB	SQL Server Databa...	9/26/2005 4:51 PM
NotificationServices	mastlog.ldf	512 KB	SQL Server Databa...	9/26/2005 4:51 PM
SDK	model.mdf	1,216 KB	SQL Server Databa...	9/26/2005 4:51 PM
Setup Bootstrap	modellog.ldf	512 KB	SQL Server Databa...	9/26/2005 4:51 PM
Shared	msdbdata.mdf	4,800 KB	SQL Server Databa...	9/26/2005 4:51 PM
Tools	msdblog.ldf	512 KB	SQL Server Databa...	9/26/2005 4:51 PM
MSSQL.1	mssqlsystemresource.ldf	512 KB	SQL Server Databa...	8/30/2005 5:37 AM
MSSQL	mssqlsystemresource.mdf	38,912 KB	SQL Server Databa...	8/30/2005 5:37 AM
Backup	ReportServer\$B131403.mdf	3,264 KB	SQL Server Databa...	9/26/2005 4:51 PM
Binn	ReportServer\$B131403_log.LDF	768 KB	SQL Server Databa...	9/26/2005 4:51 PM
Data	ReportServer\$B131403Temp...	2,240 KB	SQL Server Databa...	9/26/2005 4:51 PM
FTData	ReportServer\$B131403Temp...	768 KB	SQL Server Databa...	9/26/2005 4:51 PM
Install	tempdb.mdf	8,192 KB	SQL Server Databa...	9/27/2005 8:28 AM
JOBS	templog.ldf	512 KB	SQL Server Databa...	9/27/2005 8:28 AM
LOG				
repldata				
MSSQL.2				
OLAP				
MSSQL.3				
Reporting Services				

Type: SQL Server Database Transaction Log File Date Modified: 8/30/2005 5:37 AM Size: 512 KB

512 KB My Computer

System Tables / Metadata

- The true system tables are not directly visible to the user
 - No longer directly modifiable
 - No sp_configure 'Allow Updates'
 - Well, it doesn't do anything anymore
- Catalog views give access to the system metadata
 - Will be backward compatible even when underlying tables have to be changed
 - Most system tables from SQL Server 2000 are now views as well
- System views are typically in the *sys* schema
 - `SELECT * FROM sys.objects`
- Can only view objects you have some permission on

Backwards Compatibility

- We've worked hard to preserve backwards compatibility
 - Upgrade Advisor
 - Books Online
 - Discontinued Database Engine Functionality in SQL Server 2005
 - Deprecated Database Engine Features in SQL Server 2005
 - Breaking Changes to Database Engine Features in SQL Server 2005
 - Behavior Changes to Database Engine Features in SQL Server 2005
 - Compatibility Level – 80
 - Modifies/preserves some old behavior and syntax
 - Limits use of new capabilities
 - Recommend moving up to '90' compatibility ASAP
 - Limited lifetime – eventually even it will be deprecated



When Does Upgrade Occur?

- *master* is upgraded during Upgrade process
- Other databases are upgraded as part of database startup – once *master* is complete
- Upgrade also occurs at:
 - When a down-level database is attached
 - When a down-level database is restored
- Once upgraded a database cannot be attached or restored to a down-level SQL Server





New Features in the Database Engine



SQL Server Engine

- New Message Service Broker
- HTTP Support (Native HTTP)
- Database Tuning Advisor
- Multiple Active Result Sets
- Persisted Computed Columns
- Snapshot Isolation Level
- Table Partitioning
- VIA support
- NUMA support

.NET Framework

- Common Lang. Runtime Integration
- User-defined Aggregates
- User-defined Data Types
- User-defined Functions
- SQL Server .NET Data Provider
- Extended Triggers

Data Types

- Managed SQL Types
- New XML Datatype
- Varchar (MAX) Varbinary (MAX)

T-SQL

- Common Table Expressions (CTEs)
- PIVOT, UNPIVOT
- APPLY, EXCEPT, INTERSECT
- RANK, etc.
- TOP, OUTPUT
- Exception handling: TRY/CATCH

XML

- XQUERY Support
- XML Data Manipulation Language
- FOR XML Enhancements
- XML Schema (XSD) Support
- MSXML 6.0 (Native)
- .Net XML Framework

Database Failure and Redundancy

- Failover Clustering
- Enhanced Multi-instance Support
- Database Mirroring
- Database Snapshots

Database Maintenance

- Backup / Restore Enhancements
- Checksum Integrity Checks
- Dedicated Admin Connection
- Dynamic AWE
- Fast Recovery
- Highly-available Upgrade
- Online Index Operations
- Online Restore
- Parallel DBCC
- Parallel Index Operations
- DMVs, DDL Triggers

Performance Tuning

- Profiler Enhancements
- Profiling Analysis Services
- Exportable Showplan

Security

- All Permissions Grantable
- Fine Grain Administration Rights
- Separation of Users and Schema
- Data encryption primitives

Full-text Search

- Indexing of XML Datatype

Replication

- Replication Monitor
- Replicate DDL Changes
- Peer-to-peer Replication
- Auto-tuning Replication Agents
- Oracle Publication
- Improved Blob Change Tracking

Management Tools

- New Management Studio
- MDX Query Editor
- Version Control Support
- XML/A
- SQLCMD Command Line Tool

MDAC

- SNAC
- Microsoft Installer-based Setup
- Support for Active Dir Deployment
- Client and Middle Tier Data Caching
- SQL Client .NET Data Provider
- Server Cursor Support





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 - Messages, Queues, and Asynchronous Processing
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